AMENDMENTS TO THE CLAIMS:

1-4. (Canceled)

5. (Currently amended) The method of claim [[1]] 81, wherein the spontaneous vapor phase etchant recipe comprises a noble gas halide.

6. (Original) The method of claim 5, wherein the noble gas halide is xenon difluoride.

7. (Currently amended) The method of claim [[1]] 81, wherein the etchant recipe comprises a spontaneous interhalogen.

8. (Original) The method of claim 7, wherein the interhalogen comprises bromine trichloride or bromine fluoride.

9. (Currently amended) The method of claim [[1]] 81, wherein the etchant recipe comprises vapor phase HF.

10. (Currently amended) The method of claim [[1]] 81, wherein the etchant recipe comprises a diluent gas.

11. (Original) The method of claim 10, wherein the diluent gas is an inert gas that is selected from N_2, He, Ar, Kr and Xe.

12. (Currently amended) The method of claim [[1]] 81, wherein the step of providing the additional amount of the etchant is performed when a change of the measured amount of the chemical species over time is beyond a predetermined value.

13. (Currently amended) The method of claim [[1]] 81, wherein the step of providing the spontaneous vapor phase etchant further comprises:

preparing the etchant in an exchange chamber; and

feeding the prepared etchant via an outer circulation loop that passes through the exchange chamber and an etch chamber in which the microstructure is held.

14. (Original) The method of claim 13, further comprising: opening the outer circulation loop for feeding another additional amount of the etchant into the etch system.

15. (Currently amended) The method of claim [[1]] 81, further comprising: repeating the steps of claim 1 until the measurement of the amount of the chemical species is equal to or below another predefined value.

16. (Currently amended) The method of claim [[1]] 81, further comprising: coating the microstructure with a SAM material.

17. (Currently amended) The method of claim [[1]] 81, wherein the etchant has a pressure from 0 to 15 torr.

18. (Original) The method of claim 10, wherein the diluent gas has a partial pressure from 20 to 700 torr.

19. (Original) The method of claim 18, wherein the diluent gas has a partial pressure from 50 to 100 torr.

20. (Original) The method of claim 10, wherein the diluent gas has a partial pressure from 500 to 700 torr.

21. (Original) The method of claim 10, wherein the diluent gas has a partial pressure around 100 torr.

22. (Canceled)

23. (Canceled)

24. (Previously Presented) The method of claim 15, wherein the predefined value is 1% of an initial etch rate or an initial surface area.

25. (Previously Presented) The method of claim 12, wherein the predefined value is 20% of an initial etch rate or an initial surface area.

26. (Previously Presented) The method of claim 1, wherein the structural materials remain in the microstructure after the sacrificial materials are removed, wherein the structural material is selected from an elemental metal, a metalloid, an intermetallic compound and a ceramic material.

27. (Original) The method of claim 26, wherein the elemental metal is selected from Al, Cu and Pt.

28. (Original) The method of claim 26, wherein the intermetallic compound is selected from Ti_xAl_x and TiNi.

29. (Original) The method of claim 26, wherein the ceramic material comprises a transition metal nitride, transition metal oxide, transition metal carbide, transition metal oxynitride, transition metal silicon nitride, transition metal silicon oxynitride, metalloid nitride, metalloid oxide, metalloid carbide, metalloid oxynitride.

30-80. (Canceled)

81. (New) A method comprising a process for processing a microstructure, said process

comprising:

loading the microstructure into an etch chamber of an etch system, wherein the microstructure comprises a sacrificial material and one or more structural materials; and

etching the sacrificial material, further comprising:

providing an amount of spontaneous vapor phase etchant recipe to the etch system;

detecting an amount of a chemical species flowing out of the etch chamber resulting from etching of the sacrificial material from the present spontaneous vapor phase etchant recipe;

measuring the amount of the chemical species in the process;

determining a feeding time based on the measurement; and

further etching the sacrificial material by providing an additional amount of the spontaneous vapor phase etchant recipe to the etch system based on the determined feeding time to continue the process, and wherein the chemical species is an etch product.

82. (New) A method comprising a process for processing a microstructure, said process comprising:

loading the microstructure into an etch chamber of an etch system, wherein the microstructure comprises a sacrificial material and one or more structural materials; and

etching the sacrificial material, further comprising:

providing an amount of spontaneous vapor phase etchant recipe to the etch system;

detecting an amount of a chemical species flowing out of the etch chamber resulting from etching of the sacrificial material from the present spontaneous vapor phase etchant recipe;

measuring the amount of the chemical species in the process;

determining a feeding time based on the measurement;

further etching the sacrificial material by providing an additional amount of the

spontaneous vapor phase etchant recipe to the etch system based on the determined feeding time to continue the process; and

repeating the foregoing steps until the measurement of the amount of the chemical species indicates etch rate or an initial surface area is equal to or below 1% of an initial etch rate or an initial surface area.

83. (New) A method comprising a process for processing a microstructure, said process comprising:

loading the microstructure into an etch chamber of an etch system, wherein the microstructure comprises a sacrificial material and one or more structural materials; and

etching the sacrificial material, further comprising:

providing an amount of spontaneous vapor phase etchant recipe to the etch system;

detecting an amount of a chemical species flowing out of the etch chamber resulting from etching of the sacrificial material from the present spontaneous vapor phase etchant recipe;

measuring the amount of the chemical species in the process;

determining a feeding time based on the measurement; and

further etching the sacrificial material by providing an additional amount of the spontaneous vapor phase etchant recipe to the etch system based on the determined feeding time to continue the process, and wherein the step of providing the additional amount of the etchant is performed when a change of the measured amount of the chemical species over time is beyond a predetermined value indicating 20% of an initial etch rate or an initial surface area.

84. (New) The method of claim 83, wherein the chemical species is an etchant of the etchant recipe.

85. (New) The method of claim 83, wherein the spontaneous vapor phase etchant recipe comprises a noble gas halide.

86. (Original) The method of claim 85, wherein the noble gas halide is xenon difluoride.

87. (New) The method of claim 83, wherein the etchant recipe comprises bromine trichloride

or bromine fluoride.

88. (New) The method of claim 83, wherein the etchant recipe comprises vapor phase HF.

89. (New) The method of claim 83, wherein the etchant recipe comprises a diluent gas selected from N_2, He, Ar, Kr and Xe.

90. (New) The method of claim 82, wherein the spontaneous vapor phase etchant recipe comprises a noble gas halide.

91. (Original) The method of claim 90, wherein the noble gas halide is xenon difluoride.

92. (New) The method of claim 82, wherein the etchant recipe comprises bromine trichloride or bromine fluoride.

93. (New) The method of claim 82, wherein the etchant recipe comprises vapor phase HF.

94. (New) The method of claim 82, wherein the etchant recipe comprises a diluent gas selected from N_2, He, Ar, Kr and Xe.